

ABSTRACT

A set of techniques for rapidly computing a half-plane membership test for successive patches of pixels. By using an inheritance relation to carry forward values already computed at patch boundaries, the computational load for each successive patch is minimized. In a sample embodiment, just one interior point and one new boundary point are computed for each new patch of 64 pixels. Each of the 64 pixels can be described by an offset from one of the 5 reference points (i.e. the one interior point, the one newly computed boundary point, and 3 previously computed boundary points). By exploiting shift and complement relations, only a small number of offsets need to be independently computed (only 10 in this example). Since membership is determined merely by the sign of the relevant half-plane functions being computed, a simple compare between the half-plane function at the reference point and the half-plane function for the relevant offset suffices to evaluate the function's sign for that particular pixel.